

Maintenance Procedure

The maintenance procedure described here corresponds to the maintenance procedure set out in the Test Certificate. For the maintenance intervals refer to the Test Certificate: "[Replacement of wear and tear parts](#)". The following maintenance procedure is described:

- [Replacing filter and sealing ring in O₂ compressed gas inlet](#)
- [Replacing the O₂ pressure reducer](#)
- [Replacing the blower unit](#)
- [Replacing the internal rechargeable batteries](#)
- [Replacing the real-time clock on the Control PCB](#)

O₂ sensors, microbial filter, diaphragm in expiratory valve and dust filter see "Instructions for Use/Operating Instructions".

Replacing filter and sealing ring in O₂ compressed gas inlet

- Switch off the unit.
- Disconnect the O₂ compressed gas supply.
- Open the unit (see "Removing the rear panel").
- Remove the micro-filter **1**.
- Remove the drawer unit **2**.

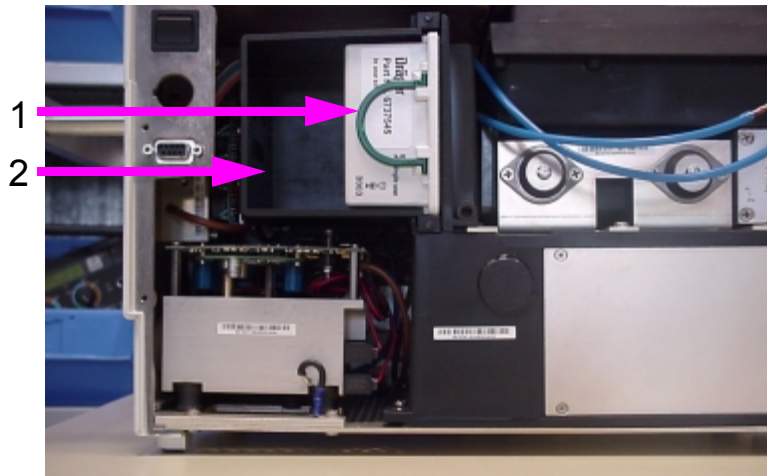


Fig.1: Removing the micro-filter.

- Remove the screws **3**.

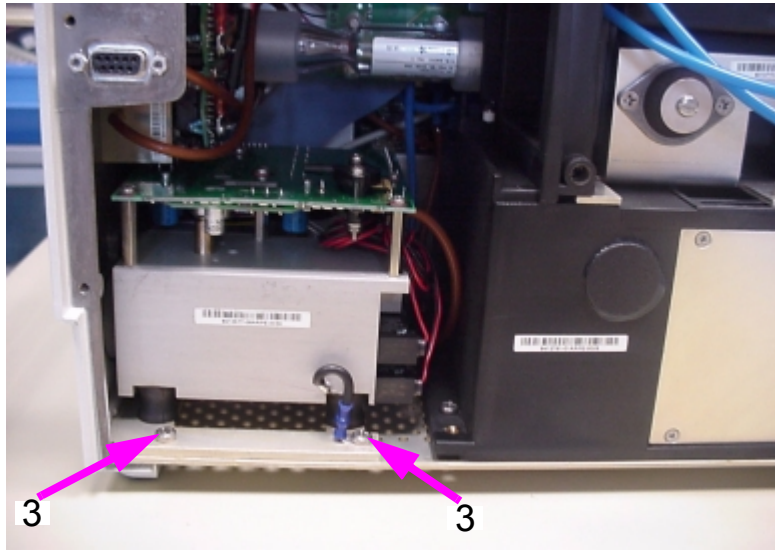


Fig.2: Removal of valve block 1



Remove also the sealing ring from the NIST connector. Otherwise the sealing ring could be lost during further disassembly.

- Remove NIST connector (if fitted) and sealing ring.

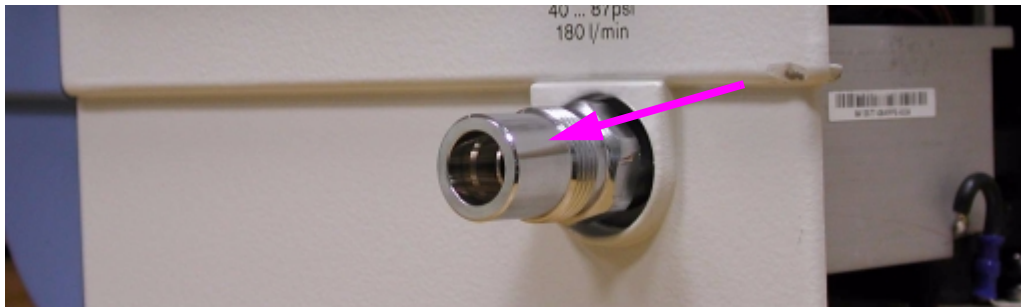


Fig.3: NIST connector

- Remove inspiratory flow sensor from plug-in unit and push up.

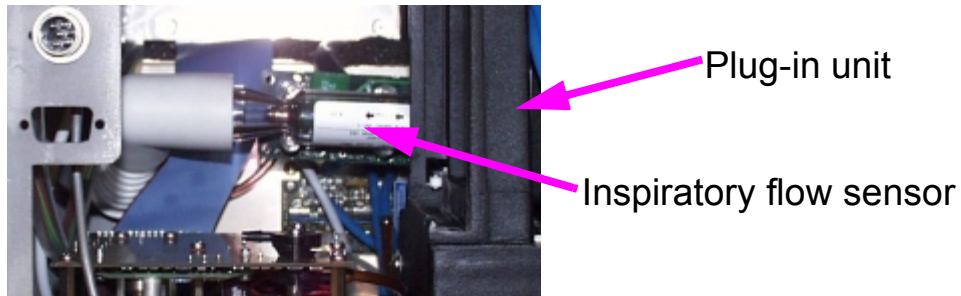


Fig.4: Removing the inspiratory flow sensor

- Remove large, transparent hose (which connects valve block to plug-in unit) from the plug-in unit.

- Pull out the valve block a little and turn 90° counter-clockwise.

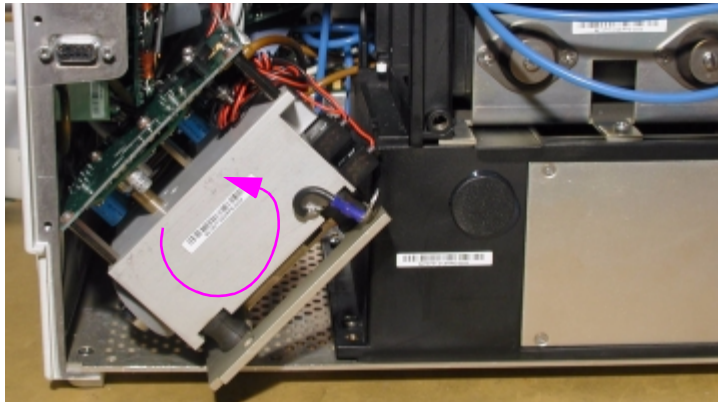


Fig.5: Turning the valve block

- Mark the hoses leading to the valve block.



Before removing the hoses from the valve block, mark them and make a note of their fitting positions.

- Remove the hoses.

- Remove the connector of the O₂ Valve PCB.



Fig.6: Removal of valve block 2

- Remove the valve block.

- Remove the screws 4.

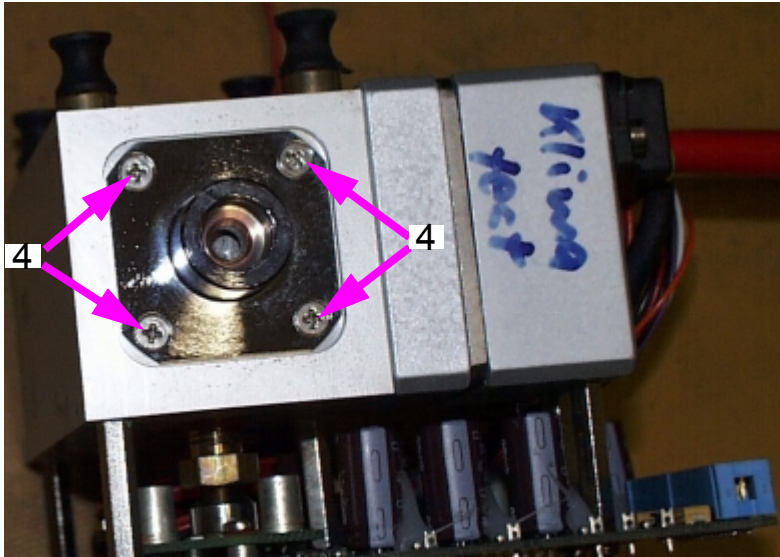


Fig.7: Removing the filter

- Remove the socket.



Before removing the filter and sealing ring, make a note of the fitting position.

- Remove the filter and sealing ring.

- Insert the new filter and sealing ring.

If the O₂ pressure reducer needs to be replaced as well, proceed with "[Replacing the O₂ pressure reducer](#)".

- Assemble the unit.



Make sure not to kink any hoses during assembly.

- Perform the safety check and functional check as per the Test Certificate.

O₂ pressure reducer

Replacing the O₂ pressure reducer

- Remove the valve block (see "[Replacing filter and sealing ring in O₂ compressed gas inlet](#)"). Follow the instructions given there from "[Switch off the unit.](#)" to "[Remove the valve block.](#)").



Before removing the O₂ pressure reducer from the valve block, make a note of its fitting position and, after removing it, the connector layout (see underside of pressure reducer).

- Remove the screws 1.

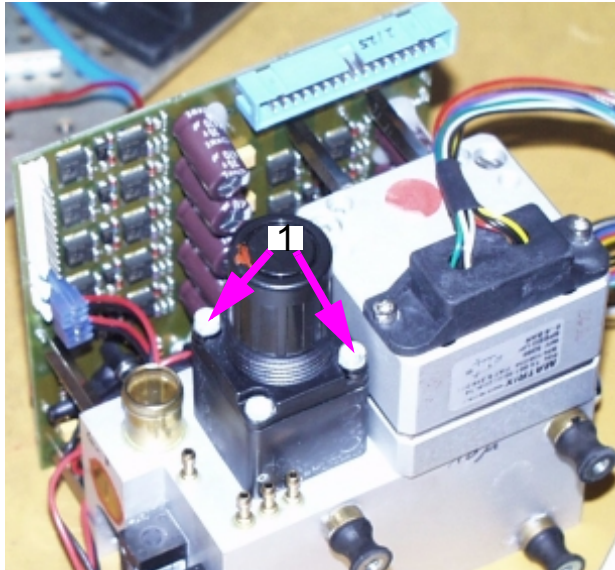


Fig.8: Replacing the O₂ pressure reducer

- Make a note of the fitting position.
- Remove the O₂ pressure reducer.
- Make a note of the connector layout.
- Fit the new O₂ pressure reducer and O-rings.
- Continue with "[Adjusting the O₂ pressure reducer](#)".

Adjusting the O₂ pressure reducer

To adjust the pressure reducer the valve block must be removed (see "[Replacing filter and sealing ring in O₂ compressed gas inlet](#)". Follow the instructions given there from "[Switch off the unit.](#)" to "[Remove the valve block.](#)").

- Connect the O₂ Valve PCB to the Savina.
- Connect the O₂ pressure supply.
- Connect pressure gauge, 0 to 6 bar (Use valid test equipment. The illustration shows only a schematic) to the nebulizer outlet of the valve block.

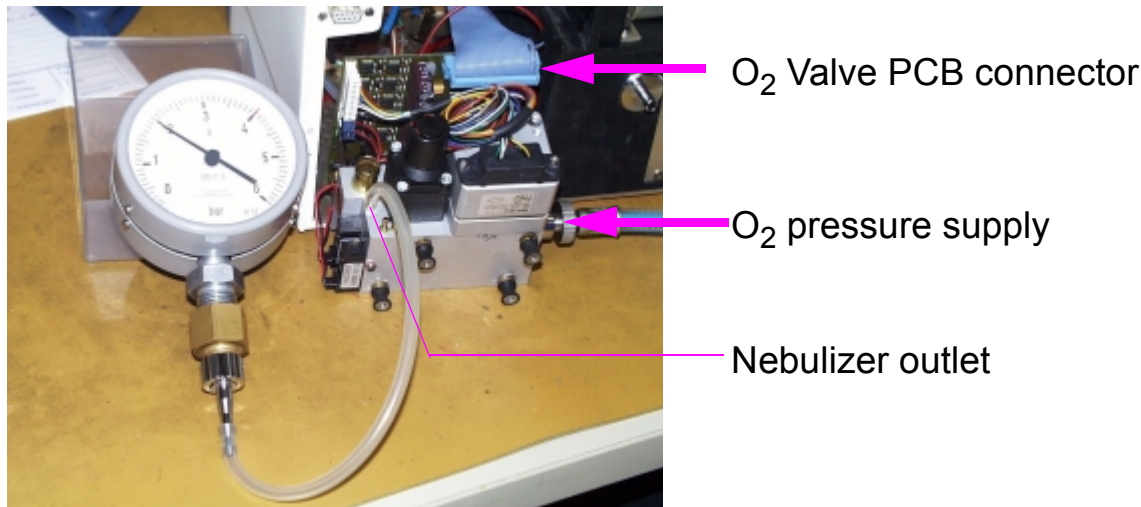


Fig.9: Pressure reducer test set-up

- Switch on Savina and start service mode (see service mode, chapter "[Entering the Internal Service Mode](#)").
- Select [Test Step 13](#).
- Switch on the nebulizer valve.



To adjust the pressure reducer the control knob must be raised. After making the adjustment the control knob must be pushed down again and secured with stop varnish.

- Raise the pressure reducer control knob.
- Adjust the pressure on the pressure gauge with the pressure reducer to 2 bar ± 0.2 mbar.
- Push the pressure reducer control knob back down.
- Secure the control knob with stop varnish.
- Switch off Savina.
- Assemble the unit.
- Perform the safety check and functional check as per the Test Certificate.

Replacing the blower unit

- Open the unit fully (see "[Opening the unit](#)").
- Remove the connector for the return valve (X644) from the Control PCB (see "[View, Control PCB](#)").
- Fold away the backing plate on which the Control PCB is mounted (see "[Folding away the Control PCB](#)").
- Remove the connector **1** from the Motor Commutator PCB.

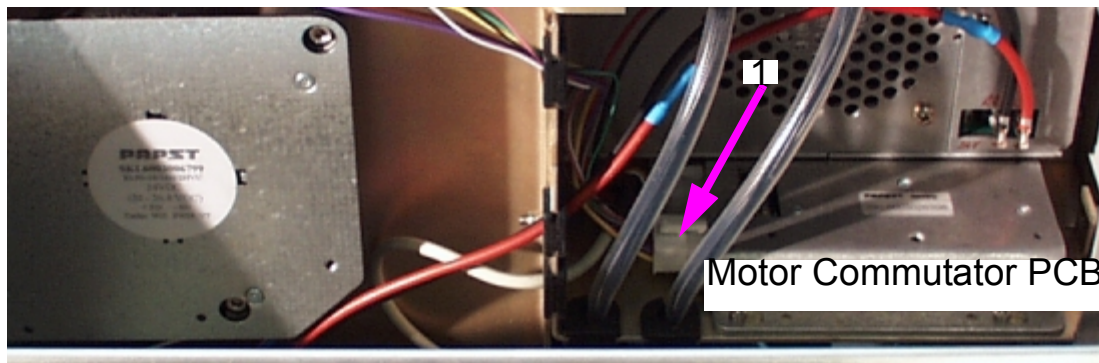


Fig.10: Motor Commutator PCB connector

- Remove the screws **2** from the fan.

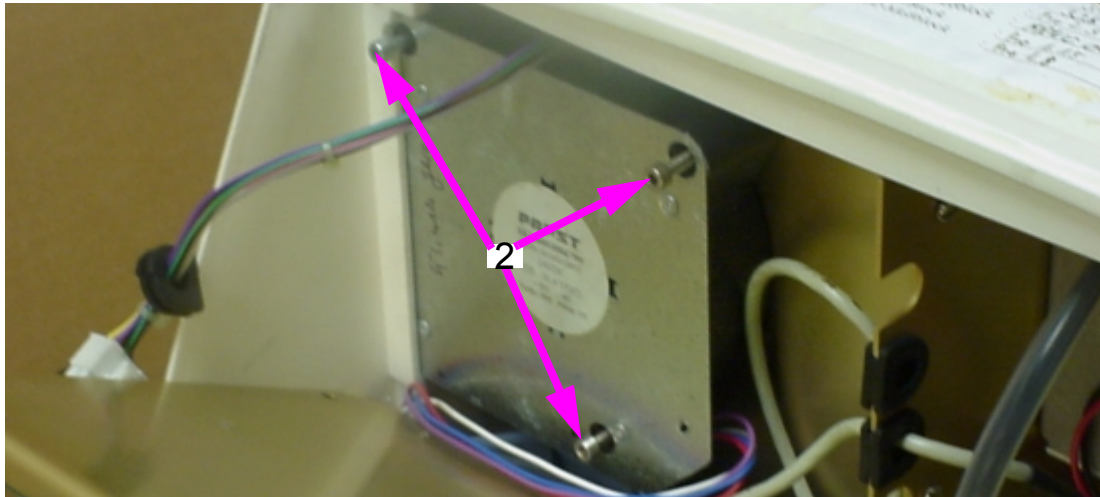


Fig.11: Removing the fan.

- Place the fan on the plate of the Control PCB.

- Remove the micro-filter **3**.
- Remove the drawer unit **4**.

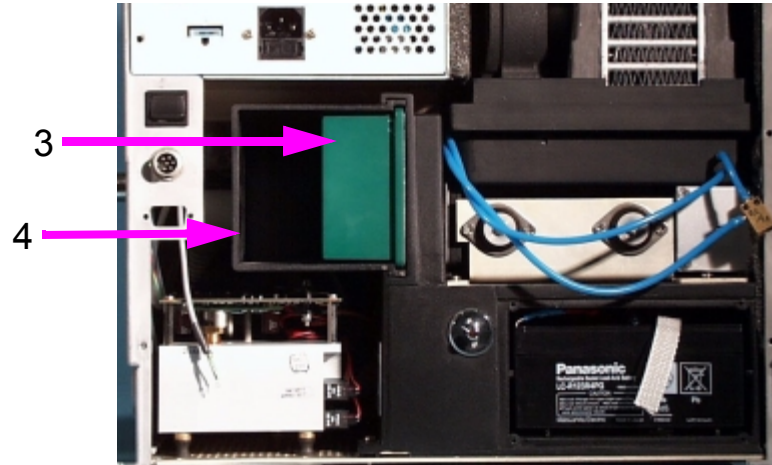


Fig.12: Removing the micro-filter.

- Remove inspiratory flow sensor from plug-in unit.

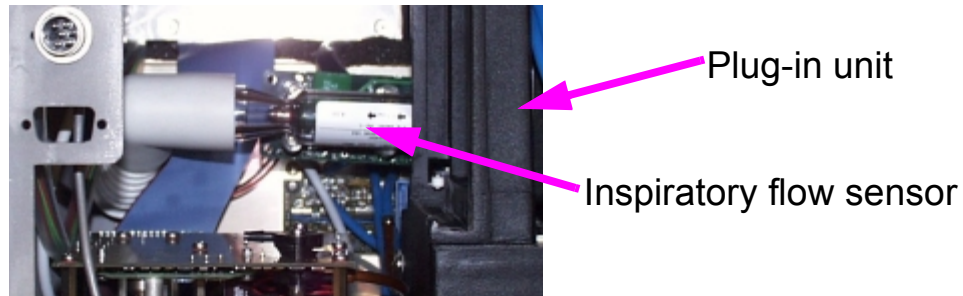


Fig.13: Removing the inspiratory flow sensor

- Remove the fixing screws **5** of the blower bracket.

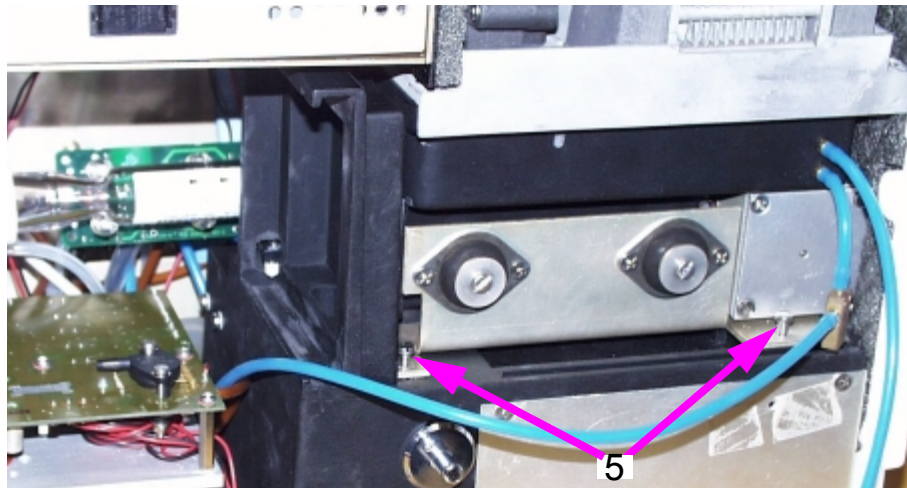


Fig.14: Slacken the blower bracket.



When withdrawing the blower pay attention to the cable connections. The cable connections must also be fed out. The removed cables are those of the Control PCB and the Motor Commutator PCB.

- Push the side panel away slightly and carefully withdraw the blower out of the unit towards the rear.
- Remove the fixing screws **6** (screws are tighten to $1.2 \text{ Nm} \pm 0.3 \text{ Nm}$).

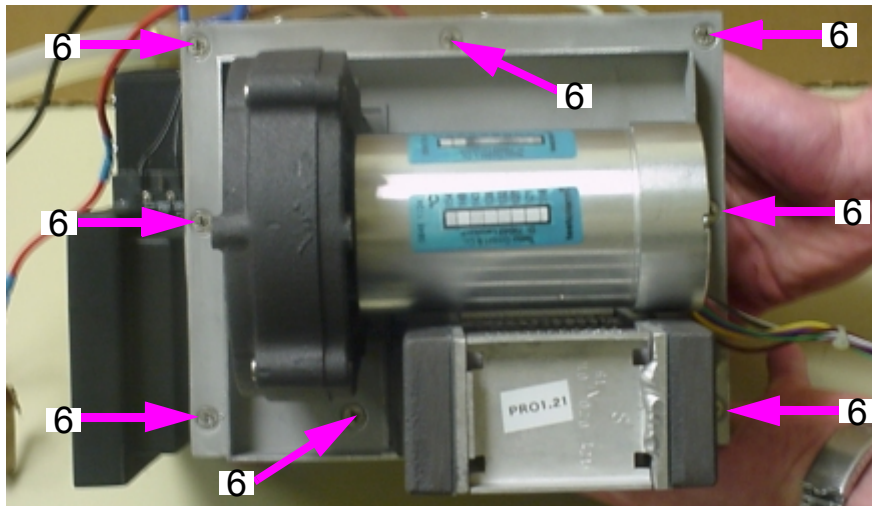


Fig.15: Removing the blower unit.

- Remove the blower block.

- Remove the fixing screws 7.

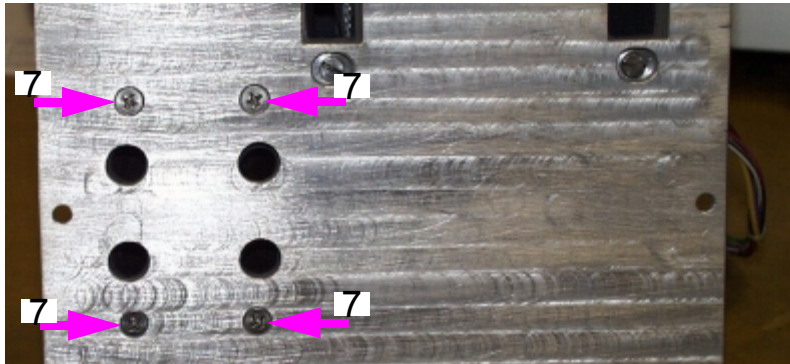


Fig.16: Removing the blower.

- Remove the blower.
- Install the new blower and seals.



The screws in step "Remove the fixing screws 6 (screws are tighten to 1.2 Nm \pm 0.3 Nm)." are tightened with to a specific torque.

- Assemble the unit.
- Perform the safety check and functional check as per the Test Certificate.

Replacing the internal rechargeable batteries

- Open the unit (see "[Removing the rear panel](#)").
- Remove the fuse for the rechargeable batteries by levering it out carefully with a screwdriver.



Fig.17: Removing the fuse of the rechargeable batteries.

- Remove the screws **1** and the cover **2**.

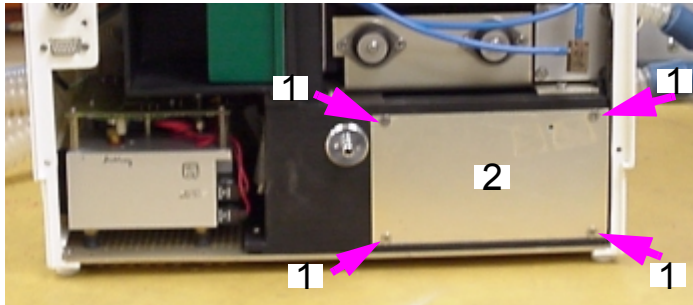


Fig.18: Removing the rechargeable batteries, part 1



The rechargeable batteries are special waste items. Dispose of the rechargeable batteries in accordance with local waste disposal regulations.

Reversing the polarity of the rechargeable batteries will damage the batteries and the power pack. Make a note of the connector layout and ensure correct polarity when fitting the rechargeable batteries.

- Remove the rechargeable batteries.



Fig.19: Removing the rechargeable batteries, part 2

- Fit new rechargeable batteries.



Inadequate voltage. The new rechargeable batteries are not sufficiently charged. Connect the Savina for at least 10 hours to the mains supply (Savina does not need to be switched on).

- Assemble the unit.
- Perform the safety check and functional check as per the Test Certificate.

Replacing the real-time clock on the Control PCB

Read the following information before replacing the real-time clock (RTC):



Do not replace the EEPROM and the RTC on the Control PCB at the same time. Otherwise the recorded operating hours will be lost. If you need to replace both components, do it in sequence, that is, complete the replacement of one component first before starting the next one.

Replace the RTC only with a brand-new RTC that has not been in use before.

The unit must be off when replacing the RTC.

Ensure the correct polarity. If the polarity of the RTC is reversed the RTC will be destroyed. Remember the installation position of the RTC.

The RTC has a battery. Dispose of the old RTC according to local waste disposal regulations.



The RTC keeps information about operating hours and settings, e.g. alarms and configurations. This information must be read out and written down before replacing the RTC.

- Read out and write down operating hours and settings, e.g. alarms and configurations.
- Switch off the unit.
- Open the unit (see "[Opening the operator control panel](#)").
- Remove the RTC (D19) from the Control PCB.

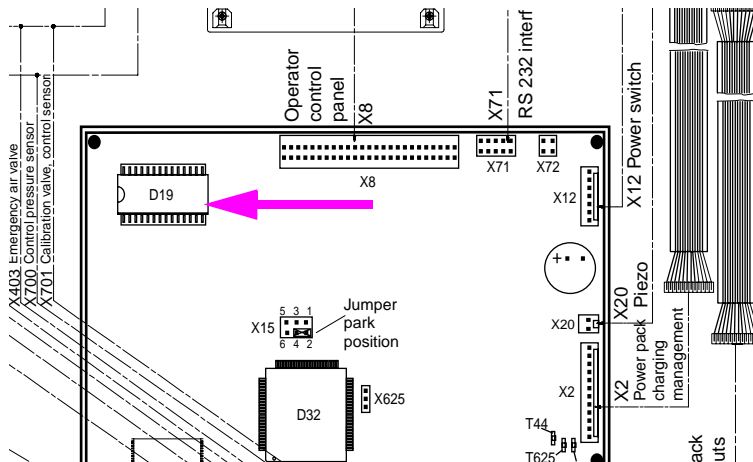


Fig.20: Removing the RTC

- Insert the brand-new RTC.
- Assemble the unit.
- Switch on the unit.

A device malfunction is generated.

- Adjust settings (as written down), time, and date on the unit.
- Switch unit off and on again.

The unit should not generate any device malfunction. Settings recently made should be available. The operating hours should have the same status as before replacement of the RTC.

- Perform the safety check and functional check as per the Test Certificate.